

UNITED STATES NAVY

# MEDICAL NEWS LETTER

Vol. 39

Friday, 20 April 1962

No. 8

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\* Denotes original articles.

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MEDICAL NEWS LETTER

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

\* \* \* \* \*

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.



HISTORICAL FUND  
of the  
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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## SPECIAL ARTICLE

Drug Resistance in the Original Treatment  
of Tuberculosis \*

LCDR J. W. Ledwith MC USN, and LT S. W. Joseph MSC USN

NOTE: This paper was read at the 21st Research Conference in Pulmonary Diseases of the Veterans Administration - Armed Forces, St. Louis, Mo., 22 - 25 January 1962. The authors give credit to the Data Processing Center, U.S. Naval Hospital, St. Albans, N. Y., for facilitating this study by processing all data analyzed. It is a reflection of progress made by the Center that this is the second clinical study report within the recent past to emanate from USNH, St. Albans. The first was reported in the Medical News Letter of 6 April 1962. In each instance, data processing activities contributed materially to the total clinical team effort. —Editor

A growing concern in tuberculosis management today is the finding of drug-resistant strains of tubercle bacilli in previously untreated cases. Incidences ranging from 2.7 to 19% have been reported from various countries, with an increase becoming evident.

At the U. S. Naval Hospital, St. Albans, N. Y., routine drug susceptibility testing on positive tuberculosis cultures commenced in April 1960. This report presents the findings, correlated with treatment response, in 84 original treatment cases collected during the ensuing year. The patients consisted of all new admissions who met the following criteria: (1) no chemotherapy had been received prior to admission; (2) sensitivity studies were performed on a positive culture obtained prior to therapy, and; (3) observation of therapy response was for 4 months or longer.

Drug susceptibility tests were performed indirectly by the standard VA method. All patients were started on isoniazid-para-aminosalicylic acid (PAS) medication or isoniazid alone before results of drug susceptibility tests were known. Therapy was not altered by a subsequent laboratory report of drug resistance per se unless clinical factors favored a poor response to therapy. Results of treatment are described below:

## Incidence of Drug Resistance (Table I)

Organisms resistant to one or more of the standard drugs were found in 15 patients, an incidence of 17.8%. Specifically, isoniazid resistance was detected in 8 cases (9.5%), streptomycin resistance in 4 cases (4.7%), and PAS resistance in 5 cases (5.9%). There were two cases of multiple drug resistance.

\* From the Medical and Laboratory Services, U. S. Naval Hospital, St. Albans, N. Y.



## Response to Therapy

Response to initial chemotherapy was considered "favorable" when symptoms abated, bacteriologic conversion occurred within 6 months, radiologic improvement or stability was noted, and no major complications occurred after

TABLE I

Incidences of Drug-Resistant and Sensitive Organisms  
in 84 Original Treatment Cases

			No. of Patients	Percentage
Resistant			<u>15</u>	<u>17.8</u>
Isoniazid	INH only	7	8	9.5
	INH-SM	1 *		
Streptomycin	SM only	2	4	4.7
	SM-INH	1 *		
	SM-PAS	1 #		
PAS	PAS only	4	5	5.9
	PAS-SM	1 #		
Sensitive			<u>69</u>	<u>82.2</u>
Totals			84	100, 0

# \* Two cases with multiple drug resistance.

resectional surgery. Cavity closure was not quantitated because it is our policy to perform surgery if cavitation persists after 4 months' chemotherapy.

Table II shows the results by this rating method. Sixty-eight of the 69 patients with sensitive organisms had "favorable" responses to initial therapy.

TABLE II

Response to Therapy in 84 Original Treatment Cases

	Sensitive Organisms	Resistant Organisms
"Favorable"	68	11
"Unfavorable"	<u>1</u> (1.5%)	<u>4</u> (26.6%)
Totals	69	15

The one patient rated "unfavorable" had only a transient bacteriologic relapse late in his course of treatment.

In the remaining 15 patients with drug-resistant organisms, 11 responded "favorably." However, 4 patients, one-fourth of the group, had definitely "unfavorable" responses to initial therapy.

Following are the laboratory findings and clinical factors responsible for rating response to therapy in each of the 15 patients with resistant organisms: The 11 patients who responded "favorably" included 5 with isoniazid resistance, 2 with streptomycin resistance (one also resistant to PAS), and 4 with PAS resistance. Sputum conversion occurred in all between one to five months. Only 2 patients required surgery. Radiologic improvement was noted in 10 patients. All were observed longer than 4 months.

The 4 patients who responded "unfavorably" to initial treatment had far more difficult hospital courses:

Patient #12, whose initial culture was resistant to 10 micrograms percent isoniazid, relapsed bacteriologically and by X ray within 2 months after resectional surgery and secondary drug coverage. Despite prolonged multiple drug therapy totaling now over one year, he failed to convert sputum or show radiologic improvement.

Patient #13 had organisms resistant to isoniazid and to streptomycin. Cavitory disease in the superior segment of the right lower lobe progressed on initial INH-PAS therapy. Sputum cultures remained positive after resectional surgery under secondary drug coverage. They remained so until isoniazide was increased to 900 mg daily and pyrazinamide was added to the regimen. She is still hospitalized after 12 months therapy.

Patient #14 on admission yielded an organism which showed resistance only to streptomycin. After 6 months isoniazid-PAS therapy, which included surgical resection of the apical and posterior segments of the right upper lobe, bacteriologic relapse occurred. Chest X ray revealed a new lesion in the remaining anterior segment. Sputum conversion was subsequently achieved by a second resectional procedure.

Patient #15 produced organisms which, in vitro, were resistant to isoniazid. He developed isoniazid-induced hepatitis after one month's therapy and was subsequently treated with daily streptomycin-PAS. Segmental resection for removal of a persistent cavity was performed after 5 months total therapy. This was complicated by a broncho-pleural fistula which necessitated a 5-rib thoracoplasty.

All of the 4 patients had localized disease.

### Comparative Analysis of Drug Resistant Cases

Eleven patients with resistant organisms responded "favorably" to initial treatment; 4 patients did not, despite comparable in vitro drug resistance findings. This variance in therapeutic response prompted a comparative analysis of selected clinical factors among these patients. The results are as follows:



Background data, such as sex, age, and race were noninformative in the study; 13 patients were male, 14 were under 40 years of age, and all were Caucasian. Such a distribution reflects our usual population in a military tuberculosis unit.

Associated disease was present in 4 patients, an incidence greater than in the over-all study group. Three of these patients responded "favorably" to treatment. One man had multiple lung bullae which were asymptomatic until tuberculosis developed. A female patient developed measles during her third month of therapy which subsided without complications. The third patient had severe periodontoclasia which required whole mouth extractions after 6 months chemotherapy. The fourth patient with associated disease, who responded "unfavorably" to treatment, was a young diabetic well controlled on NPH insulin and diet. Diabetes had been first diagnosed 5 years previously. He has exhibited no complications of the disease to date.

A definite source of contact was obtained in 5 cases only, all responding favorably to treatment. Patient #1 was a hospital corpsman exposed to a shipmate found to have active tuberculosis in 1959. He subsequently developed pleural effusion and converted his skin test. The other 4 patients had family histories of tuberculosis.

The question was raised as to possible overseas exposure to resistant bacilli in countries where single drug treatment is prevalent. Eight patients had overseas assignments some time during the 2 years prior to the development of active tuberculosis. Three patients had been with the Mediterranean Fleet, 2 in Newfoundland, and 3 in the Orient. Only one of these patients responded "unfavorably" to treatment.

Comparison of initial chemotherapy is interesting because high-dosage isoniazid therapy was started in 3 of the 4 patients who subsequently responded "unfavorably" to treatment, while this was so in only one patient who responded "favorably." The remainder received standard dosage isoniazid. None of the patients were on VA Protocols. In retrospect, it is believed we were motivated by the prominence of symptoms in the patients started on high dose isoniazid and X-ray evidence of rapid progression with cavitation.

As previously mentioned, the degree of invitro resistance showed no correlation with response to initial therapy. Two patients with organisms showing maximal resistance to isoniazid responded well to standard dosage isoniazid-PAS therapy.

The extent of disease provided the greatest correlation with therapeutic response. All patients with minimal disease (consisting of 4 with isoniazid resistance, one with streptomycin-PAS resistance, and 4 with PAS resistance) responded well to initial therapy. However, only 2 of 6 patients with advanced disease responded favorably. Further, cavitation appeared to be the most significant prognostic factor. All 4 patients who responded "unfavorably" had caseous cavitation demonstrated in their surgically resected specimens. Such caseous cavitation was not seen in the resected specimens obtained from the patient classified as far advanced because of bullous emphysema. Cavitation was not demonstrable by tomograms in the moderately advanced case who was not operated.

## Conclusions

On the basis of these data, the following tentative conclusions are made concerning original treatment cases with resistant organisms:

1. In vitro isoniazid resistance does not necessarily predict an adverse response to standard chemotherapy, particularly if the extent of disease is minimal or cavitation has not occurred. However, if cavitation is present initial isoniazid resistance should be viewed gravely.
2. Streptomycin resistance, especially in cavitory disease, warrants careful supervision of the patient even though treatment includes isoniazid.
3. PAS resistance alone should not affect response to standard chemotherapy.
4. The degree of in vitro resistance, as measured by the concentrations used in this study (and with presumed standardized diluted inocula), cannot be correlated with response to therapy.
5. If resectional surgery is planned in cases with isoniazid and/or streptomycin resistance the minimal resection should be lobectomy, even if secondary drug coverage is provided.

Finally, the incidence of drug resistance found in this study, and the difficulty in hospital management of the 4 cases described emphasize the importance of doing drug susceptibility tests routinely in original treatment tuberculosis.

## Bibliography

- (1) Raleigh, J. W., Drug Resistance Is Increasing. Bulletin NTA 1:6, 1961.
- (2) Domagk, G., Synopsis of the panel discussion: The Question of Resistant Staphylococci and Tubercle Bacilli. Dis Chest 39: 587, 1961.

\* \* \* \* \*

## Aspirin and Gastric Bleeding - Further Studies of Calcium Aspirin\*

Andrew Muir MB, ChB, and Isabel A. Cossar MB, ChB. Amer J Dig Dis 6: 1115-1125, December 1961.

The authors relate that "in 1899 Wohlgemut published the first clinical assessment of aspirin. It is doubtful if he realized what he had started. No drug has ever been used more extensively, rightly or wrongly, than aspirin. It has given its name to an era. Four thousand million aspirin tablets are swallowed annually in Great Britain, and probably relatively more on a population basis in the United States. For this reason, the toxic effects of aspirin, even if individually uncommon, are of great importance.

It has always been known that aspirin might cause dyspepsia. One person in twenty has indigestion after a single dose. In arthritics, where large doses become imperative, 15 to 20% cannot be given optimum dosage because of indigestion and other side effects. In the late 1930's, Douthwaite et al drew

\* From Law Hospital, Carlisle, Scotland.



attention to the potential severity of gastric lesions produced by aspirin and the possibility of serious hemorrhage from the stomach following its use. The hiatus of indifference which followed this work was brought to an end in 1955. Since then a steadily increasing number of papers have appeared, agreeing with, disagreeing with, or augmenting their conclusions.

The great majority fall into the first or last category. It is fair to say that aspirin-induced gastric hemorrhage is a uniformly accepted clinical entity of great importance to physicians and surgeons alike. Some workers have gone farther than others in their results and beliefs, but certain facts which can bear reiteration are steadily emerging from this plethora of information.

1. People with peptic ulcer should not take aspirin.

2. People who have aspirin dyspepsia are in danger of serious gastric hemorrhage under circumstances as yet undefined.

3. Refractory anemia of the iron-deficiency type may be the result of chronic blood loss in patients receiving regular aspirin therapy.

4. Patients with positive fecal occult blood tests should be asked about the taking of aspirin before being subjected to an extensive and unnecessary circus of gastrointestinal investigation. "

The authors believe it is necessary to indicate precisely their position in this storm of conflicting ideas. Sixteen years of work on aspirin-induced gastric hemorrhage along clinical and experimental lines have resulted in the following personal conclusions:

- "1. Aspirin can be, and is, blamed for one-eighth of the gastroduodenal hemorrhage in patients admitted to the writer's unit, irrespective of previous medical background. This may be classified as an intermediate position between the belligerent and the cautious.

2. In patients with peptic ulcer, gastroduodenal hemorrhage following the taking of aspirin is more often due to superimposed acute erosive gastritis than it is to bleeding from the actual ulcer. The reasons for this belief are explained in our previous reports.

3. Approximately one-third of peptic ulcer patients have an acute exacerbation of symptoms when they take aspirin, and they take it even if they know this is the likely result.

4. A significant number of chronic dyspeptic patients are chronic aspirin eaters and unless this is established beforehand by putting the question to them directly, they are doomed to a surfeit of barium.

5. One-fifth of patients admitted with gastroduodenal hemorrhage had no history of dyspepsia, or no cause was found for the hemorrhage on examination. Of these, 70% had taken aspirin shortly before their episode of bleeding. This agrees with the findings of other workers.

The recognition of this danger naturally encouraged pharmaceutical research into less irritant modifications of aspirin and aspirin substitutes. Before this could be done, a thorough understanding of the pharmacology of the absorption of aspirin, and indeed of all drugs, since there is a significant common

denominator, was necessary. This problem is discussed thoroughly in the reports of Smith et al., Nelson, and Schaldemose, and particularly that of Levy and Hayes which deals specifically with aspirin and explains, to our satisfaction at least, the anomalous results obtained by different clinicians."

The authors further report that among several other modifications, "aspirin has been converted into a more soluble form which, under standard conditions, is absorbed more quickly, allowing less time for gastric irritation. This has been done by preparing calcium acetylsalicylate-carbamide complex (Calurin<sup>R</sup>) and by combining aspirin with calcium carbonate and citric acid in tablet form (Solprin). Both of these tablets are difficult to manufacture and are always liable to hydrolysis if exposed to moisture, producing salicylic acid which is an intense gastric irritant. This change can be prevented by reasonable precautions and, in our experience, these modifications of aspirin have given most satisfactory results as judged clinically and by studies of gastrectomy specimens. This opinion is at complete variance with that of Lange, Alvarez, and Summerskill, and with Matsumoto et al, among others. It is supported by Douthwaite, Watson, and Pierson, and indirectly, by Levy and Hayes."

The authors studied 137 postgastrectomy specimens from patients who had been given 2 tablets of standard aspirin or 2 tablets of soluble calcium aspirin (Calurin) in equivalent dosage 2 hours before an elective partial gastrectomy for duodenal ulceration. The medications were given in 100 cc of water, were identical in appearance, coded, and their nature was unknown to the authors.

The study was confined to this group because of the high incidence of superficial erosions in patients with gastric ulcer and gastric neoplasm, and their alleged low incidence in uncomplicated duodenal ulcer patients. Further, only maximal lesions, i. e., superficial or deep erosions shaped and occupied by adherent aspirin particles, were recognized as positive evidence. Often, even in patients with duodenal ulceration, there was found a superficial erosive gastritis which was ignored, since the writers cannot accept the opinion of Magnus that it is a rarity.

The writers' previous work which involved a study of Solprin (vide supra) has been reported fully. Soluble aspirin produced no maximal lesions in 20 of these patients (5 of whom were cases of gastric ulcer) as compared with 3 in 40 patients who received two varieties of commercial brands of aspirin.

When the code was broken, it was found that 62 subjects had been given the standard tablet and 75 the soluble form. Five subjects (8%), given standard aspirin showed maximal lesions; specimens from those given the soluble form showed no maximal lesions. The lesions contained firmly adherent portions of aspirin, proved chemically, and were shaped accurately by these portions. They were 0.2 to 0.5 cm in diameter and were multiple in all cases. The lesser curve of the stomach and beneath overhanging rugae on the lower posterior wall were the commonest sites. None went deeper than the gastric mucosa, unlike one in the first series in which a true peptic ulcer was produced which was identical in shape to a half aspirin tablet deeply embedded therein.



Surrounding the lesions was an area of edema which gave the impression that the underlying erosion had penetrated deeper than it actually had. The absence of inflammatory reaction around the lesion was more noteworthy than in the first series. This was confirmed histologically where the picture was one of silent necrosis of the mucosa. It goes without saying that the reaction and depth of penetration probably depended on the viability of the stomach at the time of the operation, its blood supply, and—perhaps more significantly—the duration of action of the trapped particles of aspirin.

To summarize the present and previously published postgastrectomy series, no maximal gastric lesions occurred in 95 gastrectomy specimens of patients who received calcium aspirin, while 8 occurred in 102 who received standard aspirin tablets.

\* \* \* \* \*

### Burn Therapy \*

#### II. The Revelation of Respiratory Tract Damage as a Principal Killer of the Burned Patient

Anne Wight Phillips MD, and Oliver Cope MD. Ann Surg 155: 1-19, January 1962.

NOTE: This is the second of three articles prepared by the authors on Burn Therapy. The first, Burn Therapy I. Concealed Progress Due to a Shifting Battlefield, appeared in Annals of Surgery 152: 767, 1960. The third report by the authors, Burn Therapy III. Beware the Facial Burn, is to be published. Readers are encouraged to refer to the originals of these works inasmuch as they report a complete study and analysis of the many important aspects of burn therapy. —Editor

In an earlier part of the study of burn mortality at the Massachusetts General Hospital it was shown that hazards which were previously lethal to the burned patient are now being surmounted, but that, in many cases, the improvement is a sterile triumph, death being delayed rather than averted. Immediately, this brings up the question: What are the principal killers of burned patients today? The greatest hope of slashing the present burn mortality rate lies in identifying the killers and attacking them therapeutically. This paper deals with current causes of burn death in an effort to show the direction in which therapeutic regimen should be pushed. The data are derived from a study of all fatally burned patients entering the Massachusetts General Hospital over an 18-year period.

Selecting a single cause of death for each fatally burned case is neither easy nor always possible. In many instances, more than one cause is involved.

\* This investigation was supported by the Research and Development Division, Office of The Surgeon General, Department of the Army, under Contract No. DA-49-007-MD-726.

Pulmonary damage further embarrasses the oxygen exchange of a patient succumbing from shock, or wound sepsis adds the final straw to a burn victim already overburdened with myocardial insufficiency. Nevertheless, in the majority of instances, a principal cause of death can be singled out, and the selection graded as to its probably reliability. Occasionally, responsibility must be divided equally between two or three causes.

Surprisingly, death due to respiratory tract damage, with or without superimposed respiratory tract infection, has been and still is the primary cause of death from burns in this hospital. Wound sepsis stands second among the killers and looms larger as earlier causes of death diminish. Shock responsible for the death of one burned patient in five during the 1930's has taken a back seat in modern times.

The importance of respiratory tract damage has attracted increasing attention in some geographic areas in recent years and has been belittled in others—a difference which may be due to climatic differences in the areas involved. In warm climates respiratory tract damage may be at a minimum because a high percentage of patients are burned out-of-doors, whereas in colder regions with more people indoors and more windows shut, the opportunities for inhalation of noxious gases in damaging concentrations are inevitably increased. At this hospital, the Cocoanut Grove conflagration, in 1942, first brought the problem of respiratory tract damage in burn cases forcefully to the attention of the authors. Mallory here, and Liebow in New Haven have taken a leading part in investigation of the pathologic lesions, while Schmidt and Aviado in Philadelphia have devoted much time to the pathologic physiology. In 1954, Bull and Fisher in England, and Artz and co-workers in the United States mentioned the seriousness of respiratory tract burns. Yates et al, reporting on burn deaths in Vancouver in 1958, cited respiratory difficulties including bronchopneumonia as predominant among the causes of fatalities.

Most recently, the importance of lesions of the respiratory tract has been pointed out by Cornell of New York and by the Ad Hoc Panel of the Committee of Pathology of the National Research Council investigating forty-one fatal burns from Brooke Army Medical Center. The panel comments that respiratory tract damage can be, and has been, overlooked at autopsy as a result of the lack of systematic examination of the entire respiratory tract.

The Ad Hoc Panel suggests that an adequate necropsy examination for respiratory tract damage should include "examination of the mucous membranes of the nose, pharynx, tongue, larynx, trachea, and bronchi at various levels, as well as blocks of lung from various parts in known relationship to the gross lesions or normal landmarks."

#### Comments

The revelation of respiratory tract damage as a major killer of the burned patient raises the question as to what steps can be taken to protect the respiratory tract from damage during exposure to an atmosphere laden with the



products of incomplete combustion. There is mounting evidence that in a conflagration the danger of respiratory damage can be diminished by covering the face with a wet cloth. The public should be informed of this protective measure. Evidence for this recommendation will be dealt with in detail in the succeeding paper by the authors, Burn Therapy III. Beware the Facial Burn.

The observation that increase in fatal wound and respiratory tract sepsis in recent years is related to increased survival time among the fatally injured, although comforting to the surgeon, is hardly a cause for rejoicing. The span of time over which bacteria can invade and multiply is lengthening. Until it is learned how to control sepsis itself, each improvement in other areas of burn therapy will only increase the probability of septic involvement. In the present state of knowledge, it seems reasonable to take as many practical steps as possible to prevent unnecessary contamination. Certainly, the patient should be isolated. Colebrook showed this many years ago in connection with the streptococcus, and just recently Burke has demonstrated the easy passage of staphylococci and other organisms from patients with infected wounds to other patients in neighboring beds.

Adrenal hemorrhage is a rare complication of many disorders and, in burns, it would seem at first to be quite apart from sepsis and respiratory complications. Curiously, in this study, anoxia and sepsis (or septicemia) went hand in hand with adrenal hemorrhage. Whether this association was coincidental or causal is in the realm of speculation. Postmortem examination of the adrenals of twelve other burned patients who suffered from both anoxia and sepsis showed that adrenal hemorrhage is not an invariable sequel of these conditions.

Although adrenal hemorrhage is not a frequent occurrence in burns, it should be suspected in the patient with a shock-like picture who does not respond to adequate colloid and fluid therapy. The association of anoxia and severe sepsis should, perhaps, heighten one's suspicions.

### Summary and Conclusions

The causes of 106 consecutive burn deaths culled from the records of 1140 burned patients admitted to the Massachusetts General Hospital between June 1939 and January 1958 have been investigated.

The prime killer of the burn patient is, and has been for two decades, respiratory tract damage. Forty-two percent of the fatally injured in the series died from this cause, with or without complicating respiratory tract sepsis. Infection of the damaged respiratory tract as a rule becomes manifest if the patient survives 72 hours.

Shock, which accounted for 20% of all burn deaths in the period 1939 through 1947, has become an insignificant factor in burn deaths in recent years. Only one patient succumbed from shock in the period 1948 through 1957.

The apparent increase in deaths from wound sepsis in recent years is due to longer survival of the fatally injured (15.7 days in 1948 - 1957; 4.6 days in 1939 - 1947). The incidence of wound sepsis is slightly lower for recent

times if only patients surviving beyond the sixth day after injury are considered. Increased survival time has increased the incidence of uremic death.

Pulmonary embolism kills 3.0%. The incidence of pulmonary embolism is not significantly higher in patients with leg burns than in those with uninjured extremities. There may be a closer relationship to venoclysis. Unsuspected adrenal hemorrhage killed one patient in the series and may have contributed to the death of four more.

\* \* \* \* \*

Free Fatty Acids in Hypnotically  
Induced Emotional Stress

U. S. Department of HEW, PHS, National Institutes of Health, 4 April 1962.

Recent studies made possible through the use of hypnosis indicate that various types of emotional stress, such as depression, fear, and anger, are associated with an increase in the free fatty acids in the bloodstream. The studies, conducted by three Public Health Service scientists, Dr. Peter Mueller, Dr. Jacob Fishman, and Victor Loeffler at the National Institute of Mental Health, were reported recently to the American Psychosomatic Society in Rochester, N. Y.

The investigators stated that while earlier studies have shown that anxiety stimulates an increase in the free fatty acids (FFA), this is the first time that a response in FFA has been observed in states of depression and anger. Efforts of scientists to study hormonal and other physiologic changes that occur with depression and anger have been hampered by the almost insurmountable difficulties of inducing these emotions in realistic experimental settings. With this technic, the scientists state, it is possible to study emotion in a "pure" culture without the situational complications which may distort findings.

In these studies, conducted on volunteers, it was possible to arouse emotions almost instantly in a controlled situation and correlate FFA changes that occurred. FFA levels lend themselves to convenient and feasible measurement under these conditions. Because they change rapidly, there is ample magnitude of response (a 2-5-fold increase), and only a small blood sample is required. The role of FFA in body metabolism has been the subject of considerable scientific interest in recent years. FFA is the form in which fat goes from the fat depots via the bloodstream to the organs of the body that burn it.

The studies were conducted through a series of four sessions on sixteen pretrained volunteer subjects who were rated according to relative hypnotic susceptibility. For all of the ten subjects who were able to distinguish varying degrees of sensory distortion under hypnosis, there were significant FFA increases in one or more emotional categories after onset of suggestion. Five subjects responded to fear, four to anger, and four to depression. Three

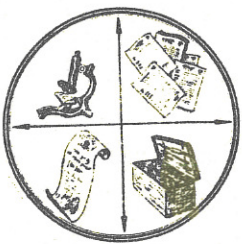


subjects had significant responses in two of the three emotions; all of the three had highest hypnotic susceptibility rating and were able to experience hallucinations. Those patients who were not able to experience sensory distortions had no FFA response to the induced emotions. The ten highly susceptible subjects, without exception, reported undergoing intense emotions accompanied by associated fantasies or memories. The most susceptible reported frequently that the emotion equalled anything experienced in the past.

This is the first time that it has been demonstrated that the ability to experience sensory distortion in hypnosis is correlated with the ability to respond physiologically to hypnotic suggestions of emotion. The authors suggest that previous psychosomatic studies with hypnosis have been controversial because investigators have not taken into consideration this crucial difference in the selection of subjects nor have they considered the ability of subjects to respond to some emotions but not to others.

It was of interest that close correlation between FFA rise and the intensity of the emotion was observed only in anger. Although FFA rise was induced in connection with other emotions, it was not in direct ratio to the intensity of the emotion experienced. The investigators speculated that the component of anger in depression may contribute to the FFA rise observed in this emotional state. The studies provide promising new leads for investigation of psychosomatic disorders, and open the way for further research in the body changes associated with emotional states.

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## MISCELLANY

### Captain James R. Kingston Receives Award

On 21 March 1962, Captain James R. Kingston MC USN was presented the Legion of Merit by the Surgeon General, Rear Admiral Edward C. Kenney MC USN. The presentation was on behalf of the Secretary of the Navy for the President of the United States, during a ceremony in Admiral Kenney's office. Attending the occasion were Mrs. Kingston and representatives from the various areas of the Bureau of Medicine and Surgery.

Upon receiving the citation and complimentary expressions from the Surgeon General, Captain Kingston stated that the success of the scientific study at Parris Island was due, in the greatest measure, to the outstanding teamwork and spirit of dedication on the part of all who participated in the research tasks.

NOTE: Readers are referred to the report of these studies and names of several co-workers in J. A. M. A., April 15, 1961; also an abstract of the article in Medical News Letter, 22 September 1961. —Editor

Captain Kingston's citation follows:



## THE SECRETARY OF THE NAVY

WASHINGTON

The President of the United States takes pleasure in presenting the LEGION OF MERIT to

CAPTAIN JAMES R. KINGSTON  
MEDICAL CORPS  
UNITED STATES NAVY

for service as set forth in the following

## CITATION:

"For exceptionally meritorious conduct in the performance of outstanding service from 1 January 1959 to 31 December 1961 as Head of the General Medicine and Surgery Research Branch, Bureau of Medicine and Surgery, Washington, D. C. Recognizing the serious loss of training time engendered by epidemics of respiratory diseases among recruit populations, Captain Kingston conceived, planned, organized, and directed a scientific study at the United States Marine Corps Recruit Depot, Parris Island, South Carolina, which identified the Eaton Agent as the prevalent causative organism in primary atypical pneumonia, and established that the administration of demethylchlortetracycline provided an effective treatment. This knowledge will materially reduce the time lost due to illness during recruit training. Captain Kingston's outstanding initiative, professional ability, leadership, and devotion to duty reflect the highest credit upon himself and the United States Naval Service."

For the President,

  
Secretary of the Navy



Corpsman Cited for Aerospace Research Tests

A Secretary of the Navy Commendation for Achievement Award was presented to Marian E. Myers HM1 USN of the Air Crew Equipment Laboratory of the Naval Air Materiel Center, Philadelphia, Penna., for his contributions to experiments in connection with projects for ACEL and National Aeronautics and Space Administration. Myers, a veteran of 17 years' Naval service, has been assigned to ACEL since 1956. During this time, he has constantly volunteered for tests which exposed him to physical hazards above normal requirements for projects assigned to the Pressure Suit Research and Development Branch, and for "Mercury" Projects for NASA.

Myers has served as a test subject to obtain valuable data concerning physiologic reaction and tolerance to certain emergency conditions likely to occur in the operation of high altitude supersonic speed Naval aircraft. He voluntarily exposed himself to all phases of experimentation and testing associated with low pressure chambers (at altitudes up to 100,000 feet), ejection seats, and underwater survival studies. Even though simulated or preliminary tests are conducted, Myers has subjected himself to conditions wherein equipment failure or human error could cause personal injury or death. For example, if a pressure suit control system fails while at high altitude, loss of life could occur if the test chamber is not immediately brought to a livable altitude. If a failure is not predicted or anticipated, such as a suit blowout, loss of life is highly probable. (NAVNEWS, 1 April 1962)

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Announcement by the FDA, DHEW

The Food and Drug Administration proposes to tighten the regulation of preparations to treat pernicious anemia. So-called "intrinsic factor" products would be labeled for sale only upon prescription under a proposal published February 17, 1962 in the Federal Register.

The statement of policy would also require that any orally administered drug for the treatment or prevention of pernicious anemia bear a warning stating it is not a reliable substitute for injections of vitamin B12, and that periodic examinations and laboratory tests are essential. Intrinsic factor is an unknown substance, prepared from the intestines of food animals, which increases vitamin B12 absorption in the human stomach.

FDA said that orally administered preparations of vitamin B12 and intrinsic factor may sometimes mask symptoms and interfere with the diagnosis of pernicious anemia; only vitamin B12 by injection is generally recognized as a wholly reliable treatment of this condition. Intrinsic factor would also be regarded as a food additive under the Federal Food, Drug, and Cosmetic Act, according to FDA, and could not be used in foods because there is no covering food additive regulation.

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Naval Medical Research ReportsU.S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Morphological Changes Produced by Gamma Radiation on the Sporogenous Cycle of Plasmodium Gallinaceum MR 005.09-1030.05 Report No. 3, January 1961.
2. Apparent Dissociation Constant of Phenol Red Determined by Spectrophotometry and by Visual Calorimetry MR 005.06-0040.02 Report No. 3, March 1961.
3. Study of Tooth Development by Tetracycline-Induced Fluorescence MR 005.02-0001.06 Report No. 6, May 1961.
4. Effect of Dibenamine on LD<sub>100</sub> Following Supralethal Dose of Total Body Gamma Radiation MR 005.12-1100.01 Report No. 5, August 1961.
5. Effect of Hemorrhage on LD<sub>100</sub> of Dog Following Supralethal Dose of Total Body Gamma Radiation MR 005.12-1100.01 Report No. 6, August 1961.
6. Muscle Physiology and Contraction Theories MR 005.08-0020.01 Report No. 5, August 1961.
7. Binding of Phenol Red by Human Serum Albumin MR 005.06-0040.02 Report No. 4, September 1961.
8. The Diminution of Thermoregulatory Sweating During Cold-Reception at the Skin MR 005.03-0050.02 Report No. 3, October 1961.
9. Activity of the Acetabular Secretory Apparatus of Cercariae of Schistosoma Mansoni Under Experimental Conditions MR 005.09-1031.01 Report No. 10, December 1961.

U.S. Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. Observations on the Variability of Cholinesterase Levels in Dog Serum. MR 005.06-0020.1.6, January 1962.
2. Equipment Testing and Development Division MR 005.12-6001.6, February 1962.

U.S. Naval Air Development Center, Aviation Medical Acceleration Laboratory, Johnsville, Pa.

1. Observations on the Relationships Between Human Acceleration End Points and the Centrifuge Acceleration Pattern MR 005.13-0002.9 Report No. 3, 6 February 1962.

U.S. Naval Medical Research Laboratory, U.S. Naval Submarine Base, New London, Conn.

1. Memorandum Report 61-9 Temporary Threshold Shift Following 60 Hours of 3.5 KC Pulses at 90 - 100 SPL MR 005.14-1200-2.02, 14 November 1961.
2. Blood pH and pCO<sub>2</sub> Homeostasis in Chronic Respiratory Acidosis Related to the Use of Amine and Other Buffers Report No. 364 MR 005.14-3002-1.07, 21 November 1961.



From the Note Book

Eleventh Armed Forces Obstetrics - Gynecology Seminar. The Eleventh Annual Armed Forces Obstetrics and Gynecology Seminar will be held at the United States Naval Hospital, Great Lakes, Ill., October 22 - 25, 1962. For further information write to CAPT B. L. Hawks MC USN, U. S. Naval Hospital, Great Lakes, Ill.

Director Designee, Navy Nurse Corps. CAPT Ruth A. Erickson, Nurse Corps, U. S. Navy, will assume the position of Director of the Navy Nurse Corps on 1 May 1962, succeeding CAPT Ruth A. Houghton NC USN, whose retirement from active naval service will be effective on that date. CAPT Erickson, who has been Chief of Nursing Service at the U. S. Naval Hospital, National Naval Medical Center, Bethesda, Md., since July 1958, was selected for appointment as Director of the Nurse Corps by the Secretary of the Navy in February 1962. She will serve in that capacity as well as Director, Nursing Division, Bureau of Medicine and Surgery, for a four-year term. She will be the tenth Director of the Navy Nurse Corps since it was established in 1908.

CAPT Erickson graduated from the Methodist-Kahler School of Nursing in Rochester, Minn., and received the Bachelor of Science degree in Nursing Education from Indiana University. Her naval career began on 27 July 1936. Having served in the grades of Ensign through Commander, she was appointed to her present rank on 1 January 1960.

Previous assignments of CAPT Erickson were Chief of Nursing Service at the U. S. Naval Hospitals in Portsmouth, Va., and Camp Lejeune, N. C. She has served on the staff of the District Medical Officer, Twelfth Naval District; as Personnel Officer in the Nursing Division, Bureau of Medicine and Surgery; and as Senior Nurse at MSTS Headquarters, North Pacific, Seattle, Wash. Her overseas duties included service on hospital ships, as a Charge Nurse in the USS RELIEF, 1938 - 1940, and as Chief of Nursing Service in the USS HAVEN, 1945 - 1946.

While stationed at the U. S. Naval Hospital, Pearl Harbor, Hawaii, 1940 - 1942, CAPT Erickson witnessed the Japanese attack on 7 December 1941. She accompanied the first war casualties who were evacuated from Pearl Harbor to the United States aboard the USS COOLIDGE on 19 December 1941. Four years later when World War II ended, CAPT Erickson was again at Pearl Harbor as Chief of Nursing Service aboard the USS HAVEN. Aboard that ship in September 1945, she participated in processing prisoners of war at Nagasaki, Japan prior to their evacuation to the United States.

CAPT Erickson is a member of the American Nurses Association, The National League for Nursing, Association of Military Surgeons of the United States, Indiana University Alumni Association, and the Arlington Symphony Association. She holds the Navy Unit Commendation, American Defense Service Medal with one star, the American Theater Medal, World War II Victory Medal, Navy Occupation Service Medal, and the National Defense Service Medal.

Olympic Development. The Armed Forces have been asked to cooperate in a program being carried on by the Olympic Development Committee. This program is primarily one of providing wider opportunities for participation in Olympic sports, with particular emphasis on those sports in which the United States does not normally field strong teams.

Individual commands can contribute toward this effort by providing some of these opportunities within their activity programs. Some of the sports that are getting particular emphasis are field hockey, canoeing, soccer, and cycling. If it is determined that you have interest within the command in some of these sports and have the wherewithal to provide some equipment, it could be a contributing factor to try to promote some organized participation. The idea is not only to familiarize individuals with new sports, but to provide those who already have the interest the opportunity to compete and improve.

Some new sports have also been added to the agenda for Olympic Competition in 1964. Among them are archery, volleyball, and judo. As new competitions, they offer opportunities for more United States Gold Medals. These sports, as well as those mentioned in the previous paragraph, have rules that are set up specifically for international competition, and these should be used whenever possible. These rules can normally be obtained from the cognizant sports governing body.

Track and Field Events: In keeping with the Olympic Development Committee's desires, the Track and Field Committee has asked that meet sponsors include within their meet structure events which are not normally found in American order of events, but are found in international competition. These would include the hop, step, and jump, the 3000-meter steeplechase, 400-meter hurdles, hammer throw, etc. It has also been asked that specialists in these events be utilized for clinics during meets when they are available.

The Track and Field programs are limited within the Navy primarily because of lack of facilities. However, commands which do carry on such programs should make every effort to cooperate in this development program. Holders of high school and college meets have been asked to hold as many "Open" events as possible and to invite Armed Forces personnel to participate in such events in all instances where they are held. (Special Services NEWS-LETTER, BuPers-NavPers 15835, January 1962)

Leprosy in the Americas. Almost 10,000 new cases of leprosy were reported in the Americas in 1958, distributed in 13 countries and 13 territories. Approximately 200,000 persons are known to be suffering from leprosy in the Americas; if all cases were registered, this number would be much higher.

#### Available Technics

Treatment with drugs such as sulfones to control the disease and reduce infectiveness of the patient.

Institutional care for treatment of selected cases.

Treatment at home for the majority of cases.

Periodic observation of contacts of cases to reduce risk of undetected infection.

Rehabilitation of some of those incapacitated.



### Achievements Expected

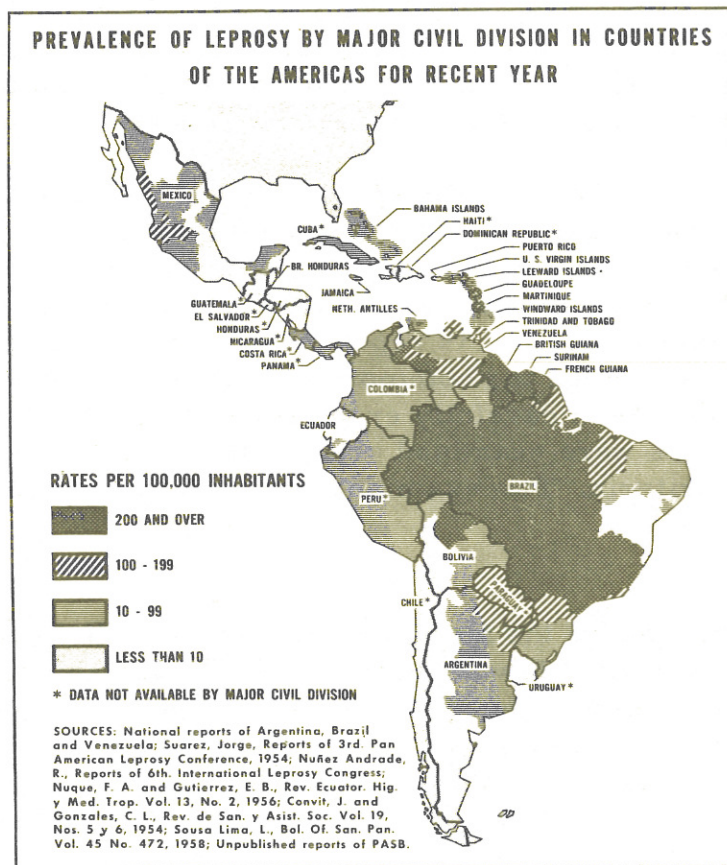
Reduction of morbidity.

Replacement of leprosariums by hospitals providing short periods of care in accordance with medical indications; decrease in costs of treatment and hospitalization; in Latin America 30,000 beds (2%) of hospital beds are in leprosariums or leprosy units.

Gain in prevention of new cases and rehabilitation of the disabled.

Outpatient therapy supervised by local health services; decreased costs.

Removal of requirements for isolation and hospitalization will decrease emotional reaction and fear of the disease among patients and families.



### Special Problems

Development of rapid and effective therapeutic agent to control disease.

Definition of the size of the problem.

Good system of case finding for early diagnosis when treatment is more effective.

Initiation of modern control programs with domiciliary treatment.

Abolition of compulsory isolation.

Integration of anti-leprosy activities into general health services.

(From: Facts on Health Problems, Pan American Health Organization - WHO, July 1961)

**DENTAL****SECTION**

An Analysis of the Commonest Causes  
of Full Denture Failure

W. Alan Lawson, MS, BDS, FDS RCS, Institute of Dental Surgery, Eastman Dental Hospital, Gray's Inn Road, London, W.C.I. The Dental Practitioner and Dental Record X(3), November 1959; Journal of the All India Dental Association 33(12): 347-349, December 1961.

In most dental practices the majority of full denture patients are well satisfied with their prostheses, but there is frequently a small percentage of patients who are persistently seeking adjustments and whose dentures are far from successful. In these patients the well-known sequence of ease, reline, remake, ease, reline.....is repeated in a never ending cycle.

In order to determine the commonest causes of these denture failures, 200 such patients have been carefully examined and detailed records kept. In each case the dentures were examined objectively and assessed in accordance with specific criteria. Two examiners participated in the investigation.

#### Method of Assessment

For the sake of convenience the factors examined were divided into 3 groups, namely: (1) Retention, (2) Jaw relations, and (3) Unstabilizing factors. The criteria by which each of these factors was judged were as follows:

1. Retention - This may be defined as the attachment of the fitting surface of the denture to the epithelium of the adjacent mucous membrane.

It is assumed that a correctly retained base should cover the greatest possible surface area of supporting tissues. It is also assumed that the entire border to the denture should be placed upon soft displaceable tissue if retention is to be developed and that:

a. In the labial and buccal vestibule, the border should at least reach the junction of alveolar mucosa and labial or buccal mucosa.

b. The posterior palatal border should reach displaceable tissue posterior to the hard palate.

c. The posterior border of the lower denture base should cross the soft tissue on the posterior part of the retromolar pad.

d. The posterior lingual border should be extended down to the floor of the mouth.

e. The anterior lingual border should be extended backwards as far as the sublingual fold when the tongue is at rest.



f. The posterior buccal border should reach the external oblique ridge.

2. Jaw Relations - This group has been further subdivided into the two components - vertical and horizontal.

a. Vertical Dimension - It is assumed that there should be at least 3 mm of freeway space.

b. Horizontal Component - This really involves only an antero-posterior position, as a lateral movement is simply a forward movement of one side of the mandible. The upper and lower teeth should meet in centric occlusion when the mandible is in its most retruded unstrained position.

3. Unstabilizing Factors - This group includes certain factors which, if neglected, may predispose towards displacing the dentures in relation to the supporting alveolar bone.

Occlusions should be balanced in left and right lateral and protrusive positions.

Articulation should be unobstructed in all movements from one occlusion to another with the teeth in contact.

The occlusal plane of the lower denture should be below the greatest convexity of the sides of the tongue when the tongue is in its usual resting position.

Neutral Zone - The teeth should be placed in a position of equilibrium between the forces developed from activity of buccal and lingual musculature.

The contour of muscular (i. e., polished) surfaces should be shaped so as to resolve muscular forces into stabilizing ones.

## Conclusions and Discussion

The commonest errors, in order of frequency, in these 200 patients are:

1. Under-extension of bases: e. g., Retromolar pad, 91%; Maxillary tuberosities, 83%; Posterior border of palate, 56%.

Very few of the dentures utilized more than a small fraction of the supporting area available. In many cases the area covered could have been more than doubled. Most standard impression trays need considerable adaptation and extension by suitable material before they can possibly carry the impression material to the required position. Those areas of the tray most commonly in need of such extension are over the retromolar pads, in the tuberosity sulcus, and at the posterior palatal margin.

2. Upper anterior teeth placed too far back: 70%.

Setting the upper anterior teeth on the crest of the residual alveolar ridge still appears to be widely practiced, apparently with the mistaken idea that this is necessary for denture stability. In reality, this posterior setting restricts the space available for the tongue which consequently tends to displace the denture forwards, interferes with speech, and fails to provide adequate support to the musculature of the upper lip, thus resulting in a very unsatisfactory appearance. In addition, the amount of overjet is reduced, thus resulting in a very unsatisfactory appearance. In addition, the amount of

overjet is reduced, thus making freedom of articulation practically impossible.

The upper anterior teeth should normally occupy the same labio-lingual position as their natural predecessors. To achieve this the central incisors should normally be set with their labial surfaces about 1 cm in front of the centre of the incisive papilla.

3. Unbalanced occlusion: 62%.

4. Obstructed articulation: 53%.

Free sliding movements of opposing occlusal surfaces were most frequently prevented by the overbite being too great in relation to the overjet. Protrusive movements were prevented chiefly by the incisor teeth-setting, and lateral excursions by the canines and first premolars.

5. Lower molars placed too far lingually: 52%.

The attempt to avoid unfavorable leverages by placing the lower molar teeth on the crest of the residual alveolar ridge frequently results in a restriction of tongue space and is completely nullified by the consequent displacement of the denture by the tongue.

6. Increased vertical dimension: 44-1/2%.

The symptoms of increased vertical dimension are practically pathognomonic and a diagnosis can almost be made over the telephone. The patient complains of indeterminate pains involving both upper and lower jaws generally. The discomfort increases markedly as the day passes and is associated with a feeling of tiredness of the jaws. Shooting pains may develop around the temporal, frontal, and zygomatic regions. Usually the patient is obliged to remove one or both dentures by midafternoon or immediately after work, when the symptoms very rapidly disappear and relief is obtained. The dentures seem quite comfortable again the following morning, but the same symptoms gradually develop once more. No ulceration is present and eating is not unduly painful.

This condition is easily avoided by ensuring that there is an adequate amount of free way space. Usually 3 mm is sufficient.

7. Lower occlusal plane too high: 34%.

One of the functions of the tongue during mastication is to place the bolus of food on the occlusal surface of the lower teeth in preparation for the next chewing stroke. If the occlusal surface is too high for the tongue to reach comfortably, the tongue will rapidly displace the lower denture by exerting its lateral thrust against the lower posterior teeth instead of against the bolus in the space between upper and lower teeth.

8. Centric occlusion does not coincide with the most retruded position of the mandible; 31%.

A true recording of the correct anteroposterior jaw relationship is frequently very difficult to obtain and small errors may be very difficult to detect clinically. Even a small error, however, will result in undesirable horizontal thrusts on both denture bases with consequent pain, damage to supporting tissues, and tendency to displace the dentures.

An interesting fact emerging from this investigation is that although so



many faults were present in these dentures the dental surgeons who referred the patients for examination had apparently been unable to detect them. It is hoped that a sequence of investigations such as that outlined above will assist practitioners in making a diagnosis of the cause of full denture failures.

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#### Factors Contributing to Traumatic Occlusion

Clyde J. Schuyler, 55 Cambridge Road, Montclair, N. J. J Pros Dent 11:708-715, July-August, 1961; Dental Abstracts 7(3):180, March 1962.

Loss of the natural dentition through deterioration of the alveolar process presents a complex dental problem. Many factors, including health, excessive tooth eruption, irregularities in arch form, and habit, may play an important part. In many instances, however, when all of these factors appeared to be negative, otherwise healthy teeth have been lost through what seemed to be traumatic injury to the supporting structures.

When there is freedom of lateral movement in eccentric positions, the cycle of mastication in each person will vary depending on the type and resistance of the food being chewed and the degree to which it is broken down. It will vary from a straight vertical movement to a more lateral movement in which the buccal cusps of the lower teeth engage the buccal inclines of the upper teeth, shearing the food as the teeth pass from the lateral eccentric position toward centric position. The cycle of mastication does not always terminate at centric position; the lower buccal cusps may pass beyond centric position and terminate on the balancing inclines of the opposing upper teeth.

There is an extreme potential of shock and trauma if the lower buccal cusp passes beyond the opposing central fossa, making contact with that surface normally spoken of as the balancing incline. A limited number of posterior teeth bear the major impact when the lower buccal cusps pass beyond centric position, onto the balancing inclines. It is these teeth that exhibit the ravaging effects produced by a traumatic occlusion.

Balancing contacts which may appear to be harmless when equal force is applied bilaterally may, with the unilateral application of force, become traumatic, destructive and extremely undesirable.

The potential of trauma on the balancing inclines can be avoided by reducing the steepness of balancing posterior tooth inclines. The author has advocated (1959) the reduction of balancing inclines. By a reduction of the steepness of balancing inclines, the most destructive trauma will be eliminated with little or no reduction of functional efficiency.

The reduction of the steepness of the balancing inclines can be accomplished easily when carving occlusal contours in oral rehabilitation. The protrusive condylar inclinations are established on the articulating instrument in the usual manner. The desired lateral and protrusive incisal guidances have been established. The condylar inclinations in the instrument are then

reduced about 10 degrees. This has the effect of reducing the steepness of the restored balancing inclines by about 5 or 6 degrees in the region of the last molar and about 3 degrees in the region of the first bicuspid. This change has no effect on the desired distribution of force in centric position, or other eccentric positions, or on masticating efficiency.

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### Personnel and Professional Notes

The 1962 Annual Meeting of the Southern California State Dental Association. The following Dental Officers attached to the U. S. Naval Training Center, San Diego, California, appeared as clinicians before the 1962 Annual Meeting of the Southern California State Dental Association held 16 April 1962 at the Biltmore Hotel, Los Angeles, Calif.

Emergency Treatment for Respiratory Failure will be presented by Cdr Richard "C" D'Vincent, DC, USN and Lt Robert E. Pike, DC, USN.

Amalgam Crowns in One Appointment will be the topic of a lecture by LCdr Clyde R. Jackson, DC, USN; Lt James N. Matchefts, DC, USNR; and Lt Charles E. Taggart, DC, USNR.

LT Bottomley Presents Lecture. Lt William K. Bottomley, DC, USN, Assistant Dental Officer, U. S. Naval Air Facility, Naha, Okinawa, presented a slide lecture on Management of Simple Malalignments and Malocclusions by the General Practitioner before Army, Navy and Air Force Dental Officers and Members of the Okinawa Dental Association on 28 February 1962 at the Fort Buckner Officers' Club.

### Newly Standardized Supply Items Available:

6520-754-2745 Bur, Friction Grip, AHP. No. 35  
6520-754-2746 Bur, Friction Grip, AHP. No. 6  
6520-754-2747 Bur, Friction Grip, AHP. No. 4  
6520-754-2748 Bur, Friction Grip, AHP. No. 2  
6520-754-2749 Bur, Friction Grip, AHP. No. 701  
6520-754-2750 Bur, Friction Grip, AHP. No. 557  
6520-754-2751 Bur, Friction Grip, AHP. No. 57  
6520-754-2752 Bur, Friction Grip, AHP. No. 1701

All of the above items have the following common nomenclature:  
Tungsten Carbide, 6s, Unit of Issue "PG", Price \$2.30.

U. S. Naval Dental School Officers Appear at Meeting. The following Dental Officers on the staff of the U. S. Naval Dental School, NNMC, Bethesda, Md., appeared recently at the following meetings:

American Prosthetic Society: Capt A. R. Frechette, DC, USN, Commanding Officer - Influence of Partial Denture Design on Distribution of Force to Abutment Teeth.



Chicago Dental Society: Capt J. F. Bucher, DC, USN, Head, Endodontics Division - Endodontic Management of Periapical Lesions.

Georgetown University: Capt A. W. Grant, DC, USN, Head, Clinical Service Department and Roentgenology Division - Oral Roentgenology.

Central Pennsylvania Dental Society: Capt J. B. Stoll, DC, USN, Head, Prosthodontics Division - Complete and Partial Dentures.

Dr. Wilson Lectures at Naval Dental School. Dr. John R. Wilson, Associate Dean of the School of Dentistry and Chairman of the Division of Periodontology, Ohio State University, lectured recently on A Simplified Technique for Adequate Gingivectomy to staff, resident, and postgraduate Dental Officers, and civilian and military guests, at the U. S. Naval Dental School, Bethesda, Md.

The program was televised from the National Naval Medical Center by closed circuit to other medical and dental activities in the local area.

Dr. Wilson is a Fellow in the American College of Dentists. He is a member of many societies, including the American Dental Association and the American Academy of Periodontology.

Dr. Wilson has published several papers among which are The Application of the Ultrasonic Dental Unit to Scaling Procedures and The Use of Ultrasonics in Periodontal Treatment.

Naval Dental Corps Continuous Education Program. A postgraduate course in Complete Dentures will be conducted 21-25 May 1962, at the U. S. Naval Dental School, NNMC, Bethesda, Md. This course consists of demonstrations and lectures in the procedures involved in complete denture prosthesis. Emphasis is placed on the physiology of oral tissues, impression considerations, maxillomandibular relationship records, patient remount procedures, and occlusal correction. Class participation in equilibration of dentures and natural contour wax-up is provided.

Capt J. B. Stoll, DC, USN, Diplomate, American Board of Prosthodontics, Head, Prosthodontics Division, will be the instructor. Quotas for the course have been assigned to the following naval districts and commands: ComOne, ComThree, ComFour, ComFive, ComSix, ComNine, PRNC, SRNC, and CNATRA. Applications should be received in the Bureau as early as possible, and preferably not less than 4 weeks prior to commencement of the course. The Bureau Professional Advisory Board will make recommendations on all requests, and upon approval by the Surgeon General, applicants will be notified of the final action. Those approved will be nominated for TAD or authorization orders, as appropriate. Accounting data will be forwarded to individual officers nominated for TAD orders. Staff Dental Officers not utilizing assigned quotas should report this information to BUMED, Code 6112, within one month of convening date of course. This will allow the Bureau to fill the quota from other districts.

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## AVIATION MEDICINE DIVISION



### Fractures of the Orbit

Cdr W. L. Erdbrink MC USN, Ophthalmology Service, U.S. Naval School of Aviation Medicine, U.S. Naval AvnMedCen, Pensacola, Florida.

Facial trauma occurs commonly today because of the auto, fist, sports, and other accidents. The broken nose is the most common facial fracture, followed by fractures of the zygoma (malar bone) and the mandible. There are three rules of thumb which should always be kept in mind: multiple facial fractures are the rule rather than the exception; about one-half are associated with major bodily injuries elsewhere; and, at least one-fourth are associated with head injury.

The "black eye" is the presenting picture of orbital trauma, and a fracture should always be suspected. The patient may complain of poor vision, numbness and swelling around the eye, nosebleed, double vision, or of difficulty in opening the mouth. Examination reveals edema, ecchymosis, and asymmetry of the face, especially of the lids and cheek. Palpation of the orbital rim may show point tenderness, bony depression, tissue emphysema, or anesthesia of the various nerve distributions. The patient's ability to open and close his mouth fully must be tested. All of the symptoms and signs of orbital fracture may be masked by edema of lids with ecchymosis or by concussion damage to the globe with reduced visual acuity.

The ocular examination is extremely important from the medicolegal standpoint, as well as for determination of the functional integrity of the eye. The visual acuity must be obtained, and ophthalmoscopy performed soon after injury. Behind a "Black Eye", may be a perforated cornea or globe, hyphema, subluxed lens, vitreous hemorrhage, retinal detachment or macular edema. All may carry a poor prognosis for a "seeing eye." An evaluation of the ocular motility to detect the presence or absence of diplopia is most important, especially that of the vertically acting muscles.

X-ray examination is not only invaluable for proper diagnosis, but is indispensable in the determination of the proper management of the fracture. PA and lateral skull films are worthless in evaluating facial and orbital fractures. The Waters nose-chin position gives the best view of the orbital floor, the zygoma, temporal arches and antra, while the Caldwell nose-forehead position gives an undistorted view of the orbital rim, frontal and ethmoid sinuses. Stereoscopic Waters and Caldwell views are very helpful in that they permit the fullest evaluation of the anatomical damage, the direction and



extent of displacement of the various parts. For further details of the zygomatic arch, the submentovertex view is most satisfactory. Laminography may be an excellent adjunct in evaluating the details of some complicated fracture problems.

### Classification of Orbital Fractures

Orbital fractures can be classified according to their regional involvement as superior, lateral, inferior or medial.

1. Superior orbital or frontal bone fractures involve the orbital rim, roof and frontal sinus. Neurosurgical problems may overshadow the orbital problem because of a fracture involving the anterior fossa with cerebrospinal rhinorrhea, brain damage and meningitis. Frontal bone involvement is indicated by palpable deformities of the superior orbital rim, supraorbital nerve anesthesia, ptosis, superior rectus weakness with diplopia on up gaze or superior oblique weakness due to a fractured trochlea with diplopia on down gaze. Posterior involvement of the orbital roof may produce an injury to the optic nerve at its foramen.

2. Lateral orbital fractures primarily concern the separation of the zygomaticofrontal suture, depression of the zygomatic arch and separation at the articulation of the zygoma with the greater wing of the sphenoid.

When the facial edema subsides, the malar eminence is flat. Since the lateral canthal ligament attaches just below and behind the zygomaticofrontal suture, the lateral canthus is displaced downward and backward, producing a pseudoptosis and vertical diplopia. A depressed zygomatic arch may impinge upon the coronoid process of the mandible, producing restricted and painful jaw movements. With either of these fractures, lateral gaze diplopia may be present due to contusion of, or hemorrhage into the lateral rectus muscle. Zygomaticosphenoidal separation damages the inferior orbital fissure, with resulting orbital hemorrhage and proptosis of the globe.

3. Inferior orbital fractures involve primarily the zygomaticomaxillary suture line with concomitant injury to the infraorbital nerve as it emerges through its foramen. Since the body of the zygoma is solid, it is rarely fractured. Its weaker supports and articulations, however, are vulnerable, and the body is displaced downward and backward through the anterolateral wall of the antrum. A separation or fracture in the vicinity of the infraorbital foramen produces anesthesia of the cheek, the ala of the nose and the lateral lip. There is local tenderness to palpation of the infraorbital rim with a loss of continuity, and the "step-off" deformity is present. Comminution of the floor of the orbit allows the orbital contents to prolapse into the antrum, producing enophthalmos, downward displacement of the globe, and diplopia. A fracture and displacement of the infraorbital rim may also produce diplopia by damage to the inferior oblique muscle itself. Since the antrum is always involved, there are tears in the mucoperiosteum, producing hemoantrum with antral cloudiness by x-ray, or "blackness" on transillumination and perhaps epistaxis.

In fractures of the zygoma, its 4 major articulations with the frontal, temporal, maxillary, and sphenoid bones are always involved, but 1 or 2 are more severely displaced than the others, depending on the angle of force from the trauma. Thus, it is convenient to state that lateral orbital fractures involve primarily the zygomatic arch and the zygomaticofrontal suture, while inferior fractures involve the zygomaticomaxillary suture and the floor of the orbit.

A specific type of inferior orbital fracture is known as the "Blow Out" fracture. Here the orbital rim remains intact, but in this internal type of orbital fracture, the floor of the orbit is involved with depression and herniation of the orbital contents, into the antrum. Blunt trauma to the globe and orbital contents produces this fracture of the floor of the orbit which has specific diagnostic features. There is a restriction of elevation as well as depression of the globe with diplopia on up and down gaze, narrowing of the palpebral fissure and enophthalmos. This is due to the herniation of the orbital contents with an incarceration of the inferior rectus and inferior oblique muscles and the surrounding tissues into the fracture fragments of the orbital floor. Immediate surgical correction of this deformity is definitely urgent.

4. Medial orbital, nasoethmoidal, or nasomaxillary fractures occur fairly commonly. The fractured ethmoid is easily produced by concussion because of its paper-thinness and results in emphysema of the lids, conjunctiva, and orbit with proptosis of the globe. The major complications of medial orbital fractures are orbital cellulitis with enophthalmos, damage to the nasal lacrimal duct system, and damage to the medial rectus muscle.

### Management

The goals in the proper management of facial injuries are the following:

(1) the replacement of bony parts to maintain the symmetry of the facial contour; (2) the maintenance of vision and ocular motility without diplopia; (3) the maintenance of function of the jaws and restoration of occlusion of the teeth; (4) the diminution of facial scars; and (5) the prevention of psychic distress secondary to functional and cosmetic defects.

In the management of the individual patient, the neurosurgical, general or plastic surgical and the concomitant orthopedic problems must be fully evaluated first. The management of the individual case varies with the experience and preferences of the individual surgeon. However, in most cases it involves teamwork, that is, close cooperation between the ophthalmologist, the rhinologist, the oral surgeon, the plastic surgeon, and the neurosurgeon.

The definitive management of facial fractures can be delayed, if necessary, for about two weeks, since fibrocalcification does not occur until 12 to 21 days after injury. An exception is a mandibular fracture where increase in soft tissue damage necessitates early surgery. Beyond six weeks after injury, the usual closed methods of reduction are impossible, and beyond three months after injury, even open reductions are unsatisfactory. After this latter period of time, only extensive plastic surgical procedures



can be used to correct the functional and cosmetic defects.

Improper or delayed management of orbital fractures may lead to marked facial deformity with associated ptosis, diplopia, enophthalmos, mandibular locking, malocclusion of the teeth and associated cosmetic and psychic problems.

The supportive therapy of all cases includes the use of tetanus toxoid, prophylactic chemotherapy, nasal shrinkage, the avoidance of blowing the nose or sneezing with the mouth closed, and the usual means to encourage the subsidence of edema and ecchymosis of the lids and face. These measures may be employed as the only treatment where minor displacement does not produce deformity or interfere with function.

The surgical management of orbital fractures includes open and closed methods of reduction. For frontal bone fractures uncomplicated by neurosurgical problems, the restoration of the continuity of the rim and roof of the orbit is usually best accomplished by open reduction, debridement, and direct interosseous wiring.

For zygomatic fractures, there are numerous techniques. The two most widely used closed methods of reduction for simple and uncomplicated fractures are the Gillies approach, via the temporal route, for the reduction of the depressed zygomatic arch, and the Kean, or intraoral approach, for elevation of the body of the zygoma. However, it is the opinion that when there is a marked separation or depression of fragments, particularly zygomatico-frontal and the zygomaticomaxillary sutures, open reduction with elevation and alignment by direct interosseous wiring is the procedure of choice. It is only with the visualization of the fracture site and its alignment directly by wire that a satisfactory point of fixation can be maintained. Wiring combined with other procedures, such as the Gillies or Caldwell-Luc, may be indicated in the individual case.

In the "Blow-Out" or internal orbital type fracture involving the floor with inability to elevate or depress the involved globe, it is recommended that an exploration of the orbital floor be performed in order to free the incarcerated periosteum and inferior ocular muscles.

### Summary

1. Every patient with a "black eye" should be suspected of having a fracture of the orbit. Multiple injuries elsewhere in the body, as well as other injuries of the face and skull, are the rule and not the exception.
2. The clinical examination of the suspected orbital fracture should include ophthalmoscopy, testing of the visual acuity and ocular motility, along with testing of the sensitivity of the cutaneous nerves about the orbit, palpation of the orbital rim, and estimation of mandibular function.
3. Stereoscopic Waters and/or stereoscopic Caldwell x-ray views are best for proper evaluation of the injury and as a guide to the institution of treatment.
4. Prophylactic chemotherapy, nasal shrinkage, and tetanus prevention are

- important therapeutic adjuncts in every case of orbital fracture. These measures may be all that are required in minor or undisplaced fracture cases.
5. In simple fractures of the orbital rim, without major displacement, the classic closed methods of manipulation and reduction are indicated.
  6. Open reduction with direct interosseous wiring is recommended when there is marked displacement of fragments or separation of suture lines. This procedure permits anatomical alignment and permanent fixation.
  7. In the "Blow-Out" fracture of the floor of the orbit, orbital floor exploration is indicated in order to free incarcerated orbital tissues.
  8. Nonrecognition and delayed or inadequate treatment may lead to the permanent serious sequelae of diplopia, enophthalmos, improper mandibular function and malocclusion as well as facial asymmetry with marked cosmetic defects and associated psychic problems.

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#### Some 20/20 Tips for the Flight Surgeon

The Ophthalmologist, Commander Wayne L. Erdbrink, MC, USN, serving on the Staff of the School of Aviation Medicine, U.S. Naval Aviation Medical Center, Pensacola, Florida, has been collecting typical case histories which he feels are of teaching value for the student flight surgeons. He considers that lessons brought out in these case would be helpful not only to student flight surgeons but to flight surgeons as well.

Case 1: A 23 year old Ensign, Student Naval Aviator, was admitted on 20 July 1961, by a Naval Auxiliary Air Station (NAAS) with a corneal ulcer of the right eye. He had previously been treated there with an application of tincture of iodine for a central corneal staining area. When first seen as an outpatient on 13 July 1961, a central corneal "rust ring" was observed and removed with a spud. Conservative treatment of mydriasis of the pupil, antibiotic drugs and patching of the right eye failed to effect a cure, thus he was admitted to the hospital.

The VOD was 20/30, not improved, VOS 20/20. A right central corneal staining area was present with surrounding edema and a brownish hue present, as seen with the slit-lamp. After denuding the corneal epithelium in the area and binocular patching, the right cornea finally healed with a resultant scar in Bowman's area. The resultant VOD was 20/25 - correcting only to 20/20-3 both with pin hole and lenses. He was discharged on 31 July 1961 and on 4 August 1961, presented to the Special Board of Flight Surgeons. It was recommended that he be found Physically Qualified and Aeronautically Adapted as an SNA, provided waiver was granted for the VOD. This recommendation was approved by BuMed and he is flying.

Comment: His flight surgeon felt that a dendritic ulcer (herpes simplex cornea) was present and performed iodine cautery, but did not use cocaine for neutralization of the iodine, resulting in a chemical corneal ulcer. Send all dendritic corneal ulcers to an ophthalmologist, or remove the diseased



corneal epithelium with a moistened sterile cotton applicator and treat with cycloplegia and patching until re-epithelization occurs.

Case 2: A 28 year old AMHCA/USN, was admitted on 5 September 1961 by a NAAS, two days after being hit in the right eye by a metallic spring. He had had atropine ointment instilled in the eye, the eye patched, and was ambulatory with a diagnosis of a lacerated right cornea.

On admission, the VOD was light perception only, VOS 20/20; a 5 mm horizontal temporal right corneal laceration was present with adherent iris and a dense traumatic cataract. Orbital x-rays did not reveal an intra-ocular metallic foreign body. On the evening of admission, under general anesthesia, the corneal wound was repaired. At the time of discharge on 5 October 1961, the ocular tension O.D. was normal, the eye white and asymptomatic, but the vision was light perception only due to the dense cataract. At a later date, cataract surgery will be indicated.

Comment: An obvious or suspected non-intact eye should be managed as follows: Transfer the patient to an ophthalmologist regardless of the time it takes; instill no drops or ointments in the eye; use binocular patches; give systemic antibiotics, sedation, and analgesia; and make him a litter patient.

Case 3: A 26 year old ADR2/USN, was admitted on 25 September 1961 by a NAAS three days after being hit in the right eye by a softball. He had been treated by atropinization of the pupil, monocular patching, and was ambulatory.

On admission, the VOD was light perception only, VOS 20/20. The anterior chamber of the right eye was 2/3 filled with bright red blood. Only the superior iris and dilated pupillary margin could be visualized and the intra-ocular tension was 40 mm Hg Schiotz. Conservative treatment of binocular patching, head of bed elevated and diamox failed to alter the situation. On 27 September 1961, the anterior chamber was totally filled with blood, the eye was "hard" and painful. He was taken to surgery and the anterior chamber drained and repeatedly irrigated with fibrinolysin. Post-operatively, there was a severe iritis, but at the time of discharge from the hospital on 18 October 1961, the VOD was 20/20, the tension normal, and the eye was white and asymptomatic.

Comment: Any blood in the anterior chamber is an ocular emergency! Management should consist of binocular patching, no drops or ointments in the eye, and pray for 5 days. These cases frequently rebleed on the 2nd to 4th post-traumatic day, have a secondary glaucoma, and can end up a blind eye.

Case 4: A 23 year old Ensign, SNA, was seen as an O.P. on 31 October 1961, being referred from a NAAS with complaints of poor vision in each eye, headaches and difficulty in seeing the instruments of the T-28 while flying in the basic instrument phase of training. As an AOC, in May of 1961, he had been qualified as a SNA by the School of Aviation Medicine with a vision of 20/15 in each eye, a cycloplegic refraction of O.D.  $\pm$  0.75 sphere, O.S.  $\pm$  0.50 sphere, and a totally normal eye examination.

At this visit, the VOD, VOS was 20/30, binocular vision 20/30, no improvement by pin hole, and the ocular examination was negative. When

confronted with the opinion that he had two normal eyes, that the glasses given to him in college for reading were  $\pm 0.25$  sphere O.U., were "window glass," and that he was not "hot to fly," he admitted the same. An NP evaluation convinced him that the "manly" thing to do was to DOR ("Drop at Own Request" or apply to be released from aviation training).

Case 5: A 22 year old Aviation Officer Candidate, SNA, was referred by the Aviation Examining Room in February 1962 because his vision was not 20/20, had decreased accommodation and he had failed the Verhoeff test. He had successfully passed 4 complete Aviation Physical Examinations prior to his arrival in Pre-Flight.

In the eye clinic, he had 20/20 vision, normal accommodation for his age, but repeatedly failed the Verhoeff test while passing other 3rd degree fusion tests. Psychiatric evaluation revealed poor motivation for flying as a Student Naval Aviator and recommended navigator/bombardier training.

Comment: In his first week in Pre-Flight, he had learned of the old Saufley saying: "Crash-Burn-Die!"

Case 6: A 24 year old Ensign, Student Naval Aviator, sustained left facial trauma on 30 October 1961, "while playing tennis." He had ecchymosis of the left lids, a left pseudoptosis, decreased sensation of the left cheek and had restricted mouth opening. The vision was 20/20 in each eye, but there was red lens diplopia in the three fields of left gaze. Stereo-Waters X-ray revealed a separation of the left zygomaticofrontal suture, depression of the zygomatic arch and a fracture through the left zygomaticomaxillary suture.

On 2 November 1961, an open reduction and direct interosseous wiring of the left zygomaticofrontal suture was performed under general anesthesia. He was returned to flight status on 28 November 1961 with normal eye motility and jaw function.

Comment: Every "black eye" should be suspected of representing an orbital fracture, until proven otherwise.

Case 7: An 18 year old Airman was evaluated as an O.P. in January 1962 with complaints of left eye pain. Complete ocular and ENT evaluations were negative; sinus x-rays were normal; cocaineization of the left S.P. ganglion did not relieve the symptoms. A psychiatric evaluation reported much marital anxiety and revealed that the patient had a habit of pushing on his left eye when worried (a habit formation like nail biting). His symptoms disappeared after this consultation.

Comment: As high as 75% of eye complaints have a psychosomatic overlay - but rule out the organic first!

Case 8: A 39 year old LCDR/USNR Naval Aviator was seen by the Special Board of Flight Surgeons on 2 March 1962. He had been placed in Service Group II one year ago because of 20/40 vision and was wearing  $-0.75 -0.25 \times 90$  over each eye. As a NavCad in 1942, a cycloplegic refraction was  $\pm 0.50$  sphere.

A cycloplegic refraction here was  $\pm 0.25 -0.50 \times 90 = 20/20$ . After not wearing his old glasses for 4 days, the unaided vision was 20/20 in each eye. He was returned to flying in Service Group I.



Comment: Here we have pre-presbyopic ciliary spasm producing false myopia and a flight surgeon was trapped into prescribing myopic lenses. This compounded the problem and placed his flying career in jeopardy. The only pair of glasses needed here, if at all, were some  $\downarrow$  lenses for reading to relax the ciliary body. Believe your retinoscopy! Put no glasses on any Service Group I Aviator who sees 20/30 or better! Never change a Service Group status because of vision without a complete ophthalmologic evaluation!

Case 9: A 28 year old retired sailor was evaluated for a blind left eye supposedly due to a left optic neuritis 3-1/2 years previously. He was malingering and had defrauded the Government all these years.

The following made the diagnosis possible: There was no ophthalmoscopic evidence of optic atrophy. He had a small angle of left esotropia - amblyopic eyes in usual adults become exotropic. A binocular visual field revealed no blind spot in the "normal" eye. With his right eye patched, he navigated the entire eye clinic and lanes around obstacles without difficulty. A binocular cycloplegic refraction with an add over O.S. and only a minus oblique cylinder over O.D. trapped him into reading 20/50 on the Lebensohn near vision chart. He has a seeing left eye!

Case 10: This 22 year old AOC, USNR, was admitted to the sick list on 10 January 1961 with a complaint of twitching of the left eye lids and of eye fatigue when reading. He had noted a variable left ptosis for the past several years; with swimming in the AOC Program, he had moderate fatigue and muscle cramps; his deceased father had ptosis.

The general physical and ocular examinations were normal except for a variable 2-3 mm left ptosis which was more marked with fatigue and with lid squeezing exercise. An I.V. "Tensilon" test was diagnostic for myasthenia gravis. He was surveyed from service with a physical profile of P-4 on 23 January 1961.

Comment: Myasthenia gravis should always be considered in every ptosis case, especially when its degree is made worse with fatigue.

Case 11: This 22 year old AOC, USNR, was admitted to the sick list on 28 March 1961, with complaints of poor VOS and with study difficulties in Pre-Flight. While in college, he had been given glasses for an "astigmatism."

Ocular examination: VOD 20/25  $\downarrow$ , VOS 20/30. Retinoscopy, the Keratometer and Slit-lamp examination revealed an early bilateral keratoconus, more marked in O.S. Large against the rule cylinders corrected OD to 20/20 -2, OS 20/25 -2. He was surveyed from service with a physical profile of E-4.

Comment: A "scissors" movement on retinoscopy is the tip-off of irregular astigmatism and early keratoconus.

Case 12: This 23 year old AOC, USNR, with a B.A. in Accounting, was referred by the Aviation Examining Room on 20 April 1961 for an evaluation of VOS not being improved by pin-hole from 20/30.

The ocular examination revealed VOD 20/20, VOS 20/30, not correcting to 20/20. Cover test revealed a small angle left esotropia at distance accounting for the mild amblyopia OS. It is interesting that he passed the Verhoeff

Test (a near test where he had only an esophoria). BUMED waived this defect for commissioning. On 10 October 1961, after completing Pre-Flight, he was commissioned an Ensign in the Supply Corps and ordered to their advanced training school.

Case 13: This 25 year old AOC, USNR, was admitted to the sick list on 5 September 1961 with a complaint of progressive decrease in vision of the right eye for the past 1-1/2 years.

Ocular examination: VOD 20/30 correcting to 20/25, VOS 20/25 to 20/20. The findings of the complete ocular examination were within normal limits except for ophthalmoscopy and slit-lamp examinations; using high plus on the ophthalmoscope, bilateral lenticular opacities were noted, and the slit-lamp revealed posterior subcapsular lens changes, more marked in O.D. He was surveyed from service with a physical profile of E-4.

Comment: Ophthalmoscopy should be a part of every flight physical examination, and these early pre-senile cataracts should have been discovered by the examining field medical activity.

Case 14: This 24 year old AOC, USNR, a member of a State Bar Association, was referred by the Aviation Examining Room on 13 September 1961 for an ocular motility evaluation in regard to NAO category status. (He had failed the pre-math course in Pre-Flight - he had never before even seen a "slip stick").

The VOD, VOS 20/20; 20 eso at distance - maddox rod, 2 eso prism cover test; deficient prism divergence due to the excessive maddox rod esophoria. He was qualified as an NAO (B) (L), but Pre-Flight was contacted and recommended he be considered as a "misfit" for aviation. On 18 November 1961 he departed for OCS, Newport, to be commissioned as a LTJG, USNR, Legal Specialist.

Comment: This lawyer was "over recruited" in the field for aviation - a short interview by the local Flight Surgeon would have made this diagnosis. Also, this is a classic case of "instrument convergence" or "instrument awareness" Maddox rod excessive esophoria. A cover test should be a part of every aviation motility examination.

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### ELECTROCARDIOGRAMS Suggested Instructions for Technicians

The following recommendations have been received from the Commanding Officer, Capt Clifford P. Phoebus, MC, USN, Naval School of Aviation Medicine, U.S. Naval Aviation Medical Center, Pensacola, Florida.

During the past year approximately 15,000 electrocardiograms have been received by this command in accordance with the provisions of paragraph 3b of BUMED INSTRUCTION 6120.15 of 1 September 1960.

In order to improve the quality of the electrocardiograms submitted from aviation activities, instruction in this area is now included in the course



of instruction for Aviation Medical Technicians at this command. However, it is felt that guide lines should be established for those activities which will not have the benefit of these trainees. It is recommended that in order to improve the quality of electrocardiograms submitted in accordance with this BUMED Instruction, the following should be noted:

1. Technicians should be thoroughly familiar with the equipment, including adjustments for standardization, damping, stylus, temperature, centering, etc.
2. Electrodes must be clean and properly applied; this includes preparation of skin surfaces. When attaching lead wires be certain that they are attached to the correct electrodes.
3. The patient must be comfortable and supine in order to eliminate somatic tremor.
4. Equipment must be properly grounded in order to eliminate sixty cycle interference.
5. Standardization must be correct. Make certain that a one millivolt input causes a deflection of the equivalent of ten millimeters on the paper. Check the standardization deflection for damping. Each lead must show a standardization deflection.
6. Electrocardiograms are to be mounted on Standard Form No. 520, "Electrocardiographic Record," or equivalent mounting. Strips should be approximately five inches in length. These may be attached as a bundle or as individual leads. Each lead must be marked in writing as I, II, III, aVR, aVL, aVF, V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>, V<sub>4</sub>, V<sub>5</sub>, or V<sub>6</sub>. Do not use "Scotch" type tape to attach leads.
7. Indicate on the Standard Form No. 520, the name, rank, service number, station, age, height and weight of the individual, and whether a previous electrocardiogram is available.

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**RESERVE**



**SECTION**

Leadership in Naval Reserve Medical Companies  
(continuation of News Letter dated 6 April 1962)

Promotion

The vagaries of promotion present leaders of medical companies with their thorniest problems, their most formidable challenges. This problem is not peculiar to men with medical designators, but it assumes special importance in this group. It is a well-known fact that few doctors remain in the U. S.

Naval Reserve for money, presently received or promised in the future. Their pride is such however, that they must be promoted, or "esprit de corps" decays, attrition mounts. Dedicated and participating Reserve Doctors are lost to medical companies all too frequently by resignation following failure of selection for promotion. Apparently this problem is nationwide.

How does leadership enter this picture? In the first place the "hump" must be repeatedly explained. Junior Officers must be convinced that their failure to be promoted is due to the simple fact of insufficient authorized billets in the next higher rank, at this particular time. Further, they must be convinced that the Navy does not prefer participation by more junior and often less dedicated officers, but that it is constrained by law from promoting them at this time. That they are none the less senior to men commissioned after them must often be reemphasized.

Members of the company must be stimulated to make themselves as eligible as possible for the few promotions available. Junior Officers must be warned that satisfactory years, and no bad fitness reports are insufficient qualifications for promotion in the narrow fields presently opening. A Reserve Doctor desiring promotion should take active duty, should take correspondence courses, and should perform so effectively that it becomes self-evident that he is of unusual value to the Navy, in comparison with his many competing contemporaries.

Members in clinical or other specialty training should be reminded to claim promotion point credit for residency training. Officers with additional duties which yield promotion point credit must be reminded to report these regularly. Each officer member should be provided with one form NAVPERS 534 card each year to keep up to date on his point credit situation. Finally, leaders must discourage by their own dedication and example, the resignation of doctors who are valuable to the Navy but who because of the present promotion picture, cannot be advanced in rank at this time.

### Active Duty

Officers with medical designators enjoy a spectrum of active duty billets available to few others. Leaders should make these billets known, and assist member-officers in securing them. A reserve nurse who attended the above mentioned seminar in San Francisco recently completed an MSTS cruise visiting several ports in the orient. Chances are good that this nurse did an excellent job for the Navy while on her active duty tour. Chances are even better that she will perform her reserve duties with unprecedented zeal, for in this trip the Navy "gave her something," through the district medical program officer, an effective Naval leader. Each officer should be encouraged to request active duty each year. Recent directives increase the chances for more of these requests to be filled.

Restating this principle for emphasis, loyalty downward means looking out for one's men, putting their welfare before one's own. It is unquestionably the most effective device available to make men believe in and follow you.



## Enthusiasm

General Dean used the teaching profession to illustrate the importance of enthusiasm. He pointed out that the most successful teachers, the ones whose lessons we remember, were not always those who knew their subject best. They were the ones who delivered themselves with spirit; those who liked and lived their subject. Who can deny that enthusiasm is contagious?

In medical companies leaders show enthusiasm by making meetings interesting and productive; attacking assigned curricula with vigor; by instilling a "can do" spirit into each member of the company. Giving each man a job is a sound idea, if its completion complements the overall mission of the unit.

Duties performed as a group beget enthusiasm. The commanding officer of a Hospital Corps Division on the West coast arranged a submarine visit for his men. He also secured rifle range facilities for his corpsmen. Can you doubt that these men will go to bat for him when he requires that they do so? A group trip to a nearby Naval hospital is an effective company project. Dinner meetings in uniform are favorites, not only of members, but of their "better halves" as well. A distinguished Navy man as guest speaker at a meeting or a dinner, will get out a crowd and stimulate interest. At a recent dinner meeting of ours the SMO of "Project Deep-Freeze" held a large audience in his hands while transmitting facts of importance to every medical officer present.

The "Code of Conduct" is a standard which imbues enthusiasm. "I am an American fighting man" is a phrase unlikely to be lost upon participating reservists, medical or otherwise.

## The Uniform

A respected member of our company recently told the group, "when I put on this uniform I feel a little taller. I walk a little straighter; I behave a little better. I feel that by this uniform the Navy makes of me a little more than I formerly was, and I do my best to justify this confidence." Most of us have shared this feeling. If the simple expedient of clothing can so bring out good things in a man, perhaps we should use it more often. The uniform is at once a challenge and a symbol of belonging. Meetings in uniform beget enthusiasm; two a year should be a minimum.

## Recruitment

New blood is the life blood of any organization. Without enthusiasm there is no recruitment. "Don't ask a buddy to drill, bring him," is a rule which applies to medical personnel as well as any other group. Reserve doctors have a tremendous potential in the overall picture of Navy recruiting because of their respected standing in the community. The cynicism and skepticism of some of our youth, and their hostility toward authority in general, and toward

the military in particular, are facts all too well known. Patriotism, democracy and dedication are lost ideas in the modern materialistic philosophy of some people, which tends to regard a military man as a "gung-ho square." When a man of respect and accomplishment lets it be known that he is proud to be a Naval Officer, the criticism of the loud-mouthed ne'er-do-well assumes a hollow ring.

Few have the opportunities of doctors to sell the Navy's wares. They contact hundreds of patients; they teach students and residents, and they lecture to large lay and professional groups. They are frequently consulted for career planning, which for most young men includes a sojourn of active military service. They, as few others, can direct the feet of qualified people toward the Navy's ranks.

### Summary and Conclusion

The foregoing paragraphs outline features of Naval leadership applicable to medical companies. General principles and specific examples of their application are cited. While many of these features must be developed and implemented by command personnel of the company, it must be eternally remembered that the strength of a chain depends on its weakest link. Each man in the Navy medical unit must be a leader; each must try to develop in himself to a higher degree these qualities of integrity, loyalty and enthusiasm. In today's Navy, as never before, a doctor can be captain of his fate, master of his destiny.

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